

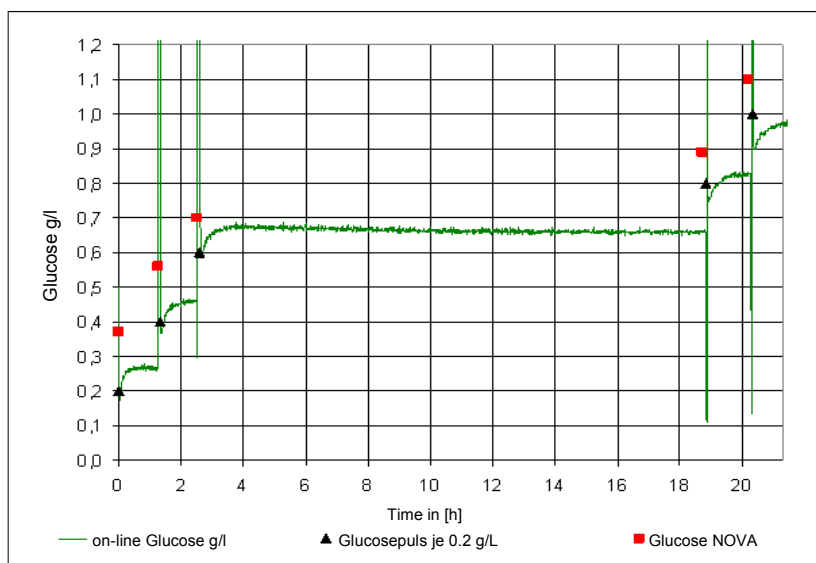
Comparison of Results between the two instruments “Bioprofile” by Nova Biomedical and the on-line Sensor “CITSens Bio“

Procedure

The investigations were focused on the response of the sensor CITSens Bio to stepwisely added glucose solution. The response time was studied and the precision and accuracy of the results were compared to those collected by other methods such as Bioprofile NOVA and HPLC and to the target values of dissolved glucose.

Results

In a first run, the sensor CITSens Bio was integrated in a shaker flask. The shaker flasks were filled with a cultivation medium without glucose addition. In a next step, 0.2 g/l glucose were added and the sensor was calibrated within this medium. In parallel, an aliquot of the medium was sampled and analysed with the instrument „Bioprofile“. Subsequently, glucose was added in steps of 0.2 g glucose per liter. The sensor response was monitored and interpreted relative to the off-line results of „Bioprofile“. In the graph below, the results monitored with CITSens Bio are displayed in green colour (on line glucose). The black triangles indicate the addition of glucose in steps of 0.2 g per liter, the red squares show the position of the Bioprofile results. The findings of both methods deviate from the theoretical value especially in the lowest concentration range. However, the findings achieved by the Bioprofile instrument deviate more (>50%) than those of the CITSens Bio sensor (< 20%). In the range of higher concentrations, the deviations of the two methods are decreasing. Concerning the whole measuring period, the sensor shows more precise and more reproducible results.



In a second run, the procedure described above was practically repeated, however only 0.1 g/l glucose were stepwisely added. In the low concentration range (< 0.6 g/l glucose), both analytical methods showed deviations from the theoretical target value. The deviation of the CITSens Bio was up to 10% cv and was more pronounced than that of Bioprofile. With increasing concentration, the deviations decreased. This phenomenon was traced back to the detection limit of the methods. At glucose concentrations of 0.7 g/l and higher, the Bioprofile instrument starts to display results which are obviously lower than the target concentration. These findings are comparable to those measured at Sanofi Pasteur and Crucell in preceding investigations. The off-line method systematically indicated lower concentrations than HPLC and CITSens Bio. This systematical error was traced back to the calibration of the instruments. In contrast to the Bioprofile, the sensor is calibrated in the medium directly, a procedure which is absolutely necessary to get information about the amount of glucose dissolved in the aqueous phase.

